9. APPENDIX

9.1 Biological Field Survey Report

Biological Field Survey Report

Jim Moore Road - Sharon Church 230 kV Transmission Line and Flanagan Mill Road Advanced Land Purchase Substation Site Gwinnett and Barrow Counties, Georgia

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EXECUTIVE SUMMARY

Executive Summary

Georgia Transmission Corporation (GTC) has identified the need to construct the new Jim Moore Road – Sharon Church 230 kV Transmission Line and the purchase of the Flanagan Mill Road Advanced Land Purchase (ALP) Substation site located in Gwinnett and Barrow Counties, Georgia. The approximately 21-acre substation study area is located along the north side of Dee Kennedy Road immediately west of the intersection of Dee Kennedy Road and Flanagan Mill Road. The approximate 10.6-mile transmission line corridor will be constructed from the existing Jim Moore Road Substation following a generally northeast direction until terminating at the Sharon Church Substation. The majority of the proposed transmission line corridor will follow existing road right-of-way (ROW).

As part of the development process for the project, Jordan, Jones & Goulding, Inc. was contracted to perform ecological studies within the proposed project area. Office and field reviews were conducted for animal and plant species listed under the protection of the Endangered Species Act. Also, state listed species were included in the office and field reviews. Field studies included delineation of Section 404 jurisdictional boundaries following the accepted methodology of the Department of the Army Corps of Engineers. This report includes a site description, study methodologies, results of field surveys, and an overview of Section 404 permit requirements.

Review of existing literature and available databases determined that nine protected species are known from Gwinnett and Barrow Counties. These species are comprised of three federally protected species (including one candidate species) and six state listed species. In addition, the Georgia Department of Natural Resources Nongame Conservation Service (GADNR-NCS) has been requested to conduct a database search for known protected species within the area. A response was received on September 11, 2007 stating that no listed or GADNR-NCS tracked species locations have been documented within the study area. Please refer to Appendix A for a copy of the correspondence with the GADNR-NCS.

Field studies were conducted to determine the presence of suitable protected species habitat and the potential occurrence of these species. There were no protected species identified within the proposed project study area; however, potential habitat was identified for one federal candidate species, Georgia aster (*Symphotrychum georgianus*), and three state listed species. State listed species include the Altamaha shiner (*Cyprinella xaenura*), bluestripe shiner (*Cyprinella callitaenia*), and bay star-vine (*Schisandra glabra*).

Field studies identified the presence of two jurisdictional wetlands, eleven jurisdictional streams, and four jurisdictional ephemeral channels within the study area. The jurisdictional wetlands are classified as palustrine emergent. Jurisdictional streams are classified as perennial and intermittent systems. Ephemeral channels are jurisdictional drainages showing signs of ephemeral flow and a direct and significant nexus to jurisdictional waters. Please refer to Section 3: Jurisdictional Studies of this report for more information regarding jurisdictional areas.

Potential Section 404 Permitting cannot be determined until final impacts are identified as a result of construction and access plans. Since the proposed transmission line consists of clearing new ROW; it is likely that jurisdictional impacts will occur as a result of establishing access for construction and maintenance. Existing forest roads and crossings will be utilized as much as possible. Please refer to Section 4: Permit Considerations of this report for a detailed discussion of permitting issues.

Jordan Jones & Goulding

SECTION 1
Introduction

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SECTION 1
Introduction

Georgia Transmission Corporation has identified the need to construct the new Jim Moore Road – Sharon Church 230 kV Transmission Line and the Flanagan Mill Road ALP Substation Site in Gwinnett and Barrow Counties, Georgia. As part of the design process for the transmission line and substation advanced land purchase, Jordan, Jones & Goulding, Inc. was contracted to perform ecological studies within the study areas. Field studies included a delineation of Section 404 jurisdictional boundaries following the accepted methodology of the Department of the Army Corps of Engineers (USACE). In addition, office and field reviews were conducted for animal and plant species listed under the protection of the Endangered Species Act. This report includes a project description, study methodologies, results of field surveys, and an overview of Section 404 permit requirements.

Site Location and Description

The project corridor is located in Gwinnett and Barrow Counties, Georgia (Figure 1). The study area is situated on the Auburn and Hog Mountain, Georgia, United States Geological Survey (USGS) 7.5-minute topographic maps (Figure 2). The study area is located within Hydrologic Unit Code 03070101 of the Upper Oconee Watershed (Figure 3).

The proposed transmission line will begin at the existing Jim Moore Road Substation located immediately south of the SR-324 (Auburn Road) and Jim Moore Road intersection. The line will traverse along SR-324 in a southeast direction for approximately 1.7 miles before going cross-country immediately past the intersection of SR-324 and Fence Road. The line will then traverse in an east-northeast direction, crossing West Union Grove Circle and East Union Grove Circle, for approximately 1.9 miles before intersecting Union Grove Church Road. Union Grove Church Road becomes Harmony Grove Church Road as the line will traverse east for approximately 3.2 miles before intersecting with Dee Kennedy Road. The line will turn northeast on Dee Kennedy Road and traverse for approximately 0.5 miles before turning northeast on Fleeman Road. The future Flanagan Mill Road Substation Site will be constructed in-line immediately west of the intersection of Dee Kennedy Road and Flanagan Mill Road. The line will then follow Fleeman Road for approximately 1.2 miles before intersecting Victron Drive. The line will then cross Hog Mountain Road onto Old Victron School Road and traverse approximately 1.3 miles before intersecting SR-124 (Braselton Highway). The proposed line will then turn northeast following SR-124 for approximately 0.8 miles before connecting to the proposed Sharon Church Substation. The total proposed transmission line length is approximately 10.6 miles.

Classifying vegetation communities is an important part of field studies. Prior to field investigations, vegetation communities of potential occurrence within the proposed project area were

determined by reviewing aerial photography. Based on this interpretation, field biologists assigned generic vegetation community types such as ruderal, forested upland, and forested wetland. This preliminary assessment was verified and expanded upon field investigation. Below is a brief description of vegetation communities occurring within the proposed project corridor.

Upland Vegetation Communities

Ruderal (R) — Ruderal communities are characterized by anthropogenic habitats currently altered by human manipulation, including residential areas, roads, and power line rights-of-way (ROW). This community provides minimal habitat for wildlife diversity. The majority of the project area consisted of ruderal habitats. Please refer to Figure 4A for a photograph of this community type.

Agricultural (Ag) — Agricultural fields are cultivated land for the production of crops or livestock. This community provides minimal habitat for wildlife diversity. Please refer to Figure 4A for a representative photograph.

Secondary Successional Mixed Hardwood-Pine (SS-MHP) — These communities are characterized by past land disturbances. The original community has been removed and several different communities may have been established and altered through time. A mixture of hardwood and pine species typically dominates these areas. Hardwood species tend to dominate the canopy. Typical species include water oak (*Quercus nigra*), red maple (*Acer rubrum*), tulip poplar (*Liriodendron tulipifera*), sweet gum (*Liquidambar styraciflua*), loblolly pine (*Pinus taeda*), and white oak (*Quercus alba*). This community provides good habitat for wildlife diversity. Please refer to Figure 4B for a photograph of this community type.

Wetland Vegetation Communities

For the purposes of this report, wetland communities are those that meet the USACE three-parameter definition of a wetland system. Delineated wetland systems were classified as emergent wetlands. The Cowardin Classification was used to further clarify types of wetland systems within the proposed project area (Cowardin *et al.,* 1989). Please refer to the Jurisdictional Studies Section of this report for a detailed classification of each wetland system within the transmission line corridor. Each community type is discussed below.

Emergent (EM) — Emergent wetlands systems are dominated by herbaceous species. These wetlands are usually characterized by saturated to inundated soil conditions throughout the year. Within the study area, dominant species typically include broad-leaf cattail (*Typha latifolia)*, soft rush (*Juncus effusus*), bladder sedge (*Carex intumescens*), sedge species (*Carex* spp.), wool-grass (*Scirpus cyperinus*), arrow-leaf tearthumb (*Polygonum sagittatum*), seedbox (*Ludwigia decurrens*), arrow arum (*Peltandra virginica*), and jewel weed (*Impatiens capensis*). This community type provides moderate wildlife habitat. Please refer to Figure 4B for a representative photograph.

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SECTION 2
Threatened and Endangered Species

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Threatened and Endangered Species

Under terms of Section 7 of the Endangered Species Act, federal agencies shall "*ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered species or result in the destruction or adverse modification of habitat of such species which is determined by the Secretary to be critical...*" The USACE requires protected species surveys for project sites that involve a Section 404 of the Clean Water Act permit.

Protected species studies were conducted within the proposed Jim Moore Road - Sharon Church 230 kV Transmission Line corridor and future Flanagan Mill Substation site to determine the occurrence or potential occurrence of protected species known from Gwinnett and Barrow Counties.

Prior to the field studies, an office review of available resources was performed to develop a list of potential federal- and state-listed species for Gwinnett and Barrow Counties, Georgia. The tentative list of known protected species was compiled by review of the federal "Redbook" – Region 4, a copy of the United States Fish and Wildlife Service (USFWS) county database (WordPerfect 6.1 tables updated December 2006) http://www.fws.gov/athens/endangered/counties_endangered.html, *Protected Animals of Georgia* (GDNR, 1999), *Protected Plants of Georgia* (Patrick *et al.,* 1995), and review of element occurrence records on the Georgia Department of Natural Resources Nongame Conservation Service (GADNR-NCS) web site http://www.dnr.state.ga.us/dnr/wild/. These sources were used to obtain descriptions of species characteristics and preferred habitat.

Review of existing literature and available databases determined that nine protected species are known from Gwinnett and Barrow Counties. This list is comprised of three federally protected species (one candidate species) and six state protected species. Of the protected species, two are faunal, and seven are floral.

In addition to reviewing existing information, a letter (Appendix A) was sent to the GADNR-NCS on August 8, 2007 requesting information regarding known occurrences of protected species within the project area. The GADNR-NCS database lists additional species which are tracked by GADNR-NCS and known to occur in the area. Typically, GADNR-NCS tracks species otherwise federally or state listed if that species is rare to all or some areas of Georgia or is commonly poached. A response was received on September 11, 2007 stating that no listed or GADNR-NCS tracked species locations have been documented within the study area. Please refer to Appendix A for a copy of the correspondence with the GADNR-NCS.

Field studies were conducted to determine if suitable habitat or the occurrence of these species is present within the study area. The entire project area was traversed on foot to evaluate the potential occurrence of protected species. There were no protected species identified within the

proposed project study area; however, potential habitat was identified for one federally listed candidate species, Georgia aster (*Symphyotrichum georgianus*), and three state listed species. State listed species include the Altamaha shiner (*Cyprinella xaenura*), bluestripe shiner (*Cyprinella callitaenia*), and bay star-vine (*Schisandra glabra*).

Please refer to Table 1 for a summary of protected species for Gwinnett and Barrow Counties. Included in Table 2 is a species/habitat matrix, which provides information on protected species and their preferred habitat. A brief description of each species follows Table 2. Brief descriptions of the federally and state protected species follow Tables 1 and 2.

Table 1
Federal and State Listed Species for Gwinnett and Barrow Counties, Georgia

Species	Vernacular Name	Federal Status	State Status	Habitat Present (yes/no)	Preferred Habitat
Fauna					
Cyprinella xaenura	Altamaha shiner	NA	E / S2	yes	small tributaries and rivers in small pools with rocky to sandy substrates in the Upper Altamaha River drainage
Cyprinella callitaenia	bluestripe shiner	NA	T / S2	yes	sandy/gravelly substrates of the Apalachicola River system and brown water streams
Flora					
Schisandra glabra	bay star-vine	NA	T / S2	yes	twining on subcanopy and understory trees/shrubs in rich alluvial woods
Isoetes melanospora	black-spored quillwort	E	E / S1	no	shallow pools (less than one foot in depth and rock rimmed) on granite outcrops, where water collects after rain
Symphyotrichum georgianus	Georgia aster	C	T / S2	yes	post oak savannah/prairie communities; roadside or utility ROWs or other disturbed areas
Hydrastis canadensis	golden seal	NA	E / S2	no	rich woods and cove forests in the mountains
Sedum pusillum	granite rock stonecrop	NA	T / S3	no	granite outcrops among mosses in partial shade under red cedar trees
Waldsteinia lobata	Piedmont barren strawberry	NA	T / S2	no	rocky acidic woods along streams with mountain laurel; rarely in drier upland oak-hickory-pine woods
Amphianthus pusillus	pool sprite	T	T / S2	no	shallow pools (less than one foot in depth and rock rimmed) on granite outcrops, where water collects after rain

E= endangered, T= threatened, C= candidate species, NA= not applicable, S1= critically imperiled, S2= imperiled, S3=vulnerable

Table 2
Species/Habitat Matrix

Habitat	Sub-Habitat	Species
Terrestrial	shallow pools on granite outcrops	pool sprite, black-spored quillwort
	shallow soils on granite outcrops under eastern red cedars	granite rock stonecrop
	rich, alluvial woods	bay star-vine
	rocky acidic woods with mountain laurel	Piedmont barren strawberry
	rich woods and cove forests in the mountains	golden seal
	roadside or utility ROWs or other disturbed areas	Georgia aster
Aquatic	small tributaries and rivers in small pools with rocky to sandy substrates of the Upper Altamaha River drainage	Altamaha shiner
	brownwater streams and larger tributaries of the Apalachicola River drainage	bluestripe shiner

Species Descriptions

Altamaha shiner – The Altamaha shiner is endemic to the upper Altamaha River drainage of north central Georgia. This species can be found in small tributaries and rivers in small pools with rocky to sandy substrates. Potential habitat for this species was located within the proposed transmission line corridor. The use of existing access roads and stream crossings will minimize grading and disturbance within the proposed ROW. GTC will implement the stringent use of BMPs, application of stream buffers, and hand clearing within stream buffers to maintain water quality, as well as minimize erosion and sedimentation. As a result of these practices, construction and maintenance of the proposed project is not likely to affect this species or its overall habitat.

Bluestripe shiner – The bluestripe shiner inhabits sandy/gravely bottoms of large rivers and their major tributaries in the Apalachicola River basin. The bluestripe shiner is known to occur in the Chattahoochee River and brown water streams of the Coastal Plain. Potential habitat for this species was located within the proposed transmission line corridor. However, there is low probability of occurrence due to the project area being located outside of the known range of this species. The use of existing access roads and stream crossings will minimize grading and disturbance within the proposed ROW. GTC will implement the stringent use of BMPs, application of stream buffers, and hand clearing within stream buffers to maintain water quality, as well as minimize erosion and sedimentation. As a result of these practices, construction and maintenance of the proposed project is not likely to affect this species or its overall habitat.

Bay star-vine – The bay star-vine is a deciduous woody vine with alternate sparsely-toothed leaves that are sweet smelling when crushed. The flowering period is from May to June with

fruiting occurring between July and August. Bay star-vine can be twining over understory trees and shrubs in rich, forested bottomlands and adjacent lower slopes. Although potential habitat for this species does occur within the project study area, no specimens were identified during field studies. Due to the linear nature of this project, impacts to this habitat will be limited to clearing of a 100-foot ROW. Existing habitat adjacent to the proposed ROW will be left undisturbed. Therefore, due to available surrounding habitat, this project is not likely to adversely affect this species or its overall habitat.

Black-spored quillwort – Black-spored quillwort is an inconspicuous perennial herb. The leaves arise from a bulbous base, are bunched, linear, slender-tipped resembling quills. This herb is restricted to shallow flat-bottomed depressions on granite outcrops, where water collects after rain. The depressions are less than one foot in depth and are entirely rock rimmed with at least one-half to one inch of soil. There was no suitable habitat for this species within the study area, and no specimens of this species were observed. Therefore, construction of this project is not likely to affect this species or its habitat.

Georgia aster – This species is a perennial herb with leaves up to three inches long and two inches wide. The inflorence consists of dark purple flowers surrounding a light reddish disk. Flower heads are large (up to 2.5 inches across), and blooming occurs in the fall. Georgia aster is a remnant of the post oak (*Quercus stellata)* savanna/prairie habitat. This species currently inhabits areas of periodic disturbance such as roadsides, right-of-ways, and edges or openings of dry upland forests. Potential habitat for this species does occur within the study area; however, no specimens were identified during field studies. Furthermore, due to the linear nature of this project, impacts to this habitat will be limited to clearing a 100-foot ROW. Existing habitat adjacent to the proposed ROW will be left undisturbed. Therefore, due to available surrounding habitat, this project is not likely to affect this species or its overall habitat.

Golden seal – Golden seal is a perennial herb eight to sixteen inches in height, forming dense clumps that arise from a golden-yellow, knotty rhizome. Golden seal can be found in rich woods and cove forests in the mountains, particularly in deciduous woods with neutral to basic soils. There was no suitable habitat for this species within the study area, and no specimens of this species were observed. Therefore, construction of this project is not likely to affect this species or its habitat.

Granite rock-stonecrop – Granite rock-stonecrop is an annual herb usually two to four inches in height with few branches and spiral leaves. This plant is found on granite outcrops among mosses in partial shade, usually in leaf litter under older, gnarled eastern red cedar trees. There was no suitable habitat for this species within the study area, and no specimens of this species were observed. Therefore, construction of this project is not likely to affect this species or its habitat.

Piedmont barren strawberry – Piedmont barren strawberry is a small perennial herb up to six inches in height and spreads by stolons. The leaves are rounded forming clumps similar to strawberry. The piedmont barren strawberry is found in rocky, acidic woods along streams with

mountain laurel (*Kalmia latifolia*). There was no suitable habitat for this species within the study area, and no specimens of this species were observed. Therefore, construction of this project is not likely to affect this species or its habitat.

Pool sprite – Pool sprite is a small annual herb with both floating and submerged leaves. This herb is restricted to shallow flat-bottomed depressions on granite outcrops, where water collects after rain. The depressions are less than one foot in depth and entirely rock rimmed with at least one-half to one inch of soil. There was no suitable habitat for this species within the study area, and no specimens of this species were observed. Therefore, construction of this project is not likely to affect this species or its habitat.

Conclusion

Nine federal and state listed species are known to occur within Gwinnett and Barrow Counties. Of these nine species, four species were noted as having suitable habitat conditions within the study area. These species include the Altamaha shiner, bluestripe shiner, Georgia aster, and bay star-vine. GTC will implement the stringent use of BMPs, application of stream buffers, and hand clearing within stream buffers to maintain water quality and minimize erosion and sedimentation. Existing stream habitat is not anticipated to be affected by construction or maintenance of the proposed project; therefore, this project is not likely to affect aquatic species or their overall habitat. Due to the linear nature of this project, impacts to potential terrestrial species habitat will be limited to clearing of a 100-foot ROW. Existing habitat adjacent to the proposed ROW will be left undisturbed. Therefore, due to available surrounding habitat and these protective measures, this project is not likely to affect terrestrial or aquatic species or their overall habitat.

SECTION 3
Jurisdictional Studies

Jordan Jones & Goulding

SECTION 3
Jurisdictional Studies

Wetland Methodologies and Parameter Evaluations

Evaluation of a habitat to determine if it meets the criteria defining a jurisdictional wetland is accomplished using one of three methods outlined in the *Army Corps of Engineers Wetlands Delineation Manual (1987 Federal Manual)*. All three methods take into account site edaphic (soils), vegetative, and hydrologic parameters to determine if a habitat should be classified as a jurisdictional wetland.

The most common method for performing a jurisdictional assessment is the Routine Determination. This method evaluates each parameter and involves a qualitative collection of data. Prior to performing field studies, resources such as USGS topographical maps, aerial photography, and county soil survey information are reviewed to identify the potential area of jurisdictional wetlands and to delineate the extent of the systems. The 1987 USACE Data Forms are completed for each community type within each wetland system.

A Comprehensive Determination is a methodology that involves collecting quantitative data for complex sites or when intensive documentation of a site is necessary. In certain cases, only one parameter may require Comprehensive Determination, while the assessment of the remaining parameters follows the Routine Determination.

The third method of performing jurisdictional assessments is the Atypical Situation method. This method is recommended in the *1987 Federal Manual* when one of the parameters for identifying jurisdictional wetlands (soils, vegetation, or hydrology) is not present or discernible because of recent human activities or natural events. Part C of this method applies to wetlands that were purposely or incidentally created by human activities but lack one or more of the parameters. Subsection 4 under Atypical Situation presents examples of man-induced hydrology for wetlands and describes these areas as usually lacking indicators of hydric soils. Hydric soils can require long periods of time to develop the normal characteristics indicative of wetland hydrology and subsurface anaerobic conditions.

For this project, the Routine Determination methodology was followed during the identification of jurisdictional area within the study area.

After deciding which methodology is appropriate, each wetland parameter should be evaluated to make the wetland determination. Below is a brief discussion of each parameter.

Vegetation

In both the Routine and Comprehensive Determinations, all dominant plants should be identified to species. The vegetation parameter is the strongest, most reliable parameter in undisturbed wetland communities. Following identification, the *National List of Plant Species that Occur in Wetlands - Southeast Region* (Reed, 1988) should be consulted to determine the wetland indicator status of each species. The indicator status of a plant may fall into one of the categories listed in Table 3.

Table 3
Plant Indicator Status Categories (adopted from the *Federal Manual*)*

Indicator Status	Indicator Symbol	Definition
Obligate Wetland Plants	OBL	Plants that occur almost always (estimated probability > 99%) in wetlands under natural conditions, but also may rarely occur (estimated probability < 1%) in non-wetlands. Examples: *Spartina alterniflora, Taxodium distichum.*
Facultative Wetland Plants	FACW	Plants that usually occur (estimated probability > 67% to 99%) in wetlands, but also occur (estimated probability 1% to 33%) in non-wetlands. Examples: *Fraxinus pennsylvanica, Cornus foemnia.*
Facultative Plants	FAC	Plants with a similar probability (estimated probability 33% to 67%) of occurring in both wetlands and non-wetlands. Examples: *Acer rubrum, Smilax rotundifolia.*
Facultative Upland Plants	FACU	Plants that occur sometimes (estimated probability 1% to > 33%) in wetlands but occur more often (estimated probability > 67% to > 99%) in non-wetlands. Examples: *Quercus rubra, Potentilla arguta.*
Obligate Upland Plants	UPL	Plants that rarely occur (estimated probability > 1%) in wetlands, but almost always occur (estimated probability > 99%) in non-wetlands under natural conditions. Examples: *Pinus echinata, Bromus mollis.*

* Categories were originally developed and defined by the USFWS National Wetlands Inventory and subsequently modified by the National Plant List Panel. The three facultative categories are subdivided by (+) and (-) modifiers.

Analysis of the vegetation parameter in a Comprehensive Determination involves detailed sampling of various strata to establish plant dominance. In a Routine Determination, dominance may be based on visual observations of each stratum. For the vegetation parameter to be satisfied, a plant community should have greater than 50 % of the dominant species with a rating of facultative, facultative wetland, or obligate wetland. An alternative to the 50% dominance criteria is the facultative-neutral option. This option may be used when a district questions the indicator status of a dominant species. When dominant species with an indicator of facultative occur with facultative upland or facultative wetland dominant plant species, the facultative species may be considered neutral; therefore, the jurisdictional status of the parameter would be based on the greater number of facultative wetland species versus facultative upland species. Should the facultative wetland dominant species equal the facultative upland species, then associate species are considered. Should the number still be equal, then the jurisdictional status is determined by the soil and hydrology parameters. The final step within the vegetation

parameter is to identify the type of vegetation community and wetland system following the *Classification of Wetlands and Deepwater Habitats* (Cowardin *et al.,* 1989).

Soils

The soil parameter is the least reliable for determining the current status of a community. Review of the soil parameter more reliably reveals historical data, because of the time required for formation of hydric soils is estimated to take from 15 to 50 years by some accounts. Hydric soils that have been drained and fail to support hydrophytic vegetation do not meet the criteria of the soil parameter. However, hydromorphic and redoximorphic characteristics are very consistent and are often used to determine the line between wetland and upland. Hydric soils that have been drained and fail to support hydrophytic vegetation do not meet the criteria of the soil parameter.

Hydric soils are formed during periods of saturation or inundation. These periods create an anaerobic environment within the upper horizons of the soil profile. According to the *1987 Federal Manual*, the following criteria apply to hydric soils:

- All histosols except folists;
- Soils in aquic suborders, aquic subgroups, albolls suborder, salorthids great group, or pell great groups of vertisols that are:
    - Somewhat poorly drained and have a water table less than 6-inches from the surface for a significant period (usually a week or more) during the growing season; or
    - Poorly drained or very poorly drained and have either:
        - A water table at less than 1.0 foot from the surface for a significant period (usually a week or more) during the growing season if permeability is less than 6-inches in any layer within 20-inches; or
        - A water table at less than 1.5 feet from the surface for a significant period (usually a week or more) during the growing season if permeability is less than 6-inches in any layer within 20-inches; or
- Soils that are ponded for a long or very long duration during the growing season; or
- Soils that are frequently flooded for a long duration or very long duration during the growing season.

Soils may be determined to be hydric by using regional indicators in addition to referencing the 1991 *Hydric Soils of the United States.* Several criteria are listed in the 1987 *Federal Manual,* each of which indicates the presence of hydric soils.

Non-Sandy Soils:

- **Organic soils (histosols)** - Organic soils are saturated for long periods of time and commonly are called muck. Soils are determined to be organic if more than 50% of the upper 12-inches of soil is composed of organic material or if organic material lies directly over bedrock.

- **Histic epipedons** - Histic epipedons are soils with an 8- to 16-inch layer of soil that is sufficiently saturated to prevent aerobic decomposition of the organic surface. Histic epipedons must be saturated for 30 consecutive days or more for soils containing a minimum of 20% organic matter when no clay is present or a minimum of 30% organic matter when the clay content is 60% or higher.

- **Sulfidic material** - Sulfidic material is determined to be present within the soils when waterlogged, permanently saturated soils emit an odor of rotten eggs. This odor is an indication of the presence of hydrogen sulfide created from a reducing environment.

- **Aquic or peraquic moisture regime** - An aquic moisture regime essentially is free of dissolved oxygen due to strong reducing conditions. The soil is saturated by groundwater, and dissolved oxygen is removed from the soil by soil fauna and root systems. The soil temperature must be above 5 degrees celsius (°C) at some point while the soil is saturated. A peraquic soil regime requires the presence of groundwater always at or near the soil surface.

- **Reducing soil conditions** - During periods of prolonged inundation or saturation, soils will begin to undergo reducing conditions. These conditions result in iron being reduced from the ferric state to the ferrous state. In the field, this can be confirmed by a qualitative test using alpha, alpha dipyridil, a chemical reagent. If the iron in the soil has been reduced, a pink color would occur when the alpha, alpha dipyridil is added to the soil sample.

- **Soil colors** - When anaerobic conditions result in soil reduction, mineral soils often will produce gray or very dark colors. These colors are a direct result of the reduction of iron, manganese, and other elements in the soil. Soils that are saturated for a long duration usually exhibit bluish to greenish-gray colors. This effect is referred to as gleying. The Munsell Color Charts can be used to determine gleyed soils. Mineral soils that are saturated (but not for prolonged periods) will develop a low chroma matrix that may or may not contain mottles. Under these conditions, the mottles often will be "bright" Munsell colors. As a general rule, mineral hydric soils will exhibit one of the following conditions: 1) matrix chroma of 2 or less in mottled soils; or 2) matrix color of 1 or less in unmottled soils.

- **Soil appearing on hydric soils list** - The National Technical Committee for Hydric Soils maintains an updated list of soil types that are known to be hydric or to have hydric inclusions. This list can be referenced to determine if a soil type is hydric. Many National Resources Conservation Service (NRCS) offices also maintain a list of known hydric soils that can be more beneficial on a regional basis.

Sandy Soils:

- **High organic matter content in surface horizon** - Sandy soils that are inundated or saturated for prolonged periods usually develop a layer of organic matter near the surface horizon. This can be attributed to anaerobic conditions that greatly reduce decomposition of the organic matter.

- **Streaking of subsurface horizons by organic matter** - As the water table fluctuates in sandy soils, organic material is carried through the soil profile. The movement of the organics through the soil profile often results in organic streaking in certain portions of the soil profile that are subject to water table fluctuation. Areas of organic streaking can be observed visually with the assistance of a sharpshooter shovel.

- **Organic pans** - As stated above, organic material moves within the soil profile as the water table fluctuates. The organics have a tendency to accumulate in the area that represents the average depth of the water table. The presence of elemental aluminum can result in the soils becoming hardened at the average depth of groundwater. This hardened layer often is referred to as a spodic horizon. Soil pits must be excavated to determine if spodic horizons are present.

In addition to the 1987 *Federal Manual*, several other publications are available that provide guidance in the identification of hydric soils. These publications are available for use at both the regional and national levels. Examples include *Redoximorphic Features for Identifying Aquic Conditions* (North Carolina Agricultural Research Service, 1995) and *Field Indicators of Hydric Soils in the United States* (United States Department of Agriculture, 1995). These resources often provide detailed information on the identification of hydric soils. The USACE district in which the work would be performed should be contacted to ensure that the usage of hydric soil indicators other than those in the 1987 *Federal Manual* is acceptable.

Mapped Soils within the Study Area

The *Soil Survey Geographic Database for Barrow, Hall, and Jackson Counties, Georgia* (2006) and the *Soil Survey Geographic Database for Gwinnett County, Georgia* (2006) were consulted to determine soil-mapping units within the study area. The soil mapping units were compared to the *National Hydric Soils List by State* (USDA-SCS, 2007) to determine if hydric soils are known to occur within the study area. According to the soil survey, 30 soil mapping units are located within the study area (Figures 5A through 5N) with three listed in the *Hydric Soils of Georgia*. The Chewacla-Wedhakee complex, Chewacla soils, and Worsham sandy loam are

listed as being hydric soils for Georgia. Below is a brief discussion of the mapped soil units occurring within the study area.

Table 4
Summary of Soil Series Occurring Within the Project Study Area

Soil Series	Soil Mapping Unit	Erodibility (Low, Med, High)	Soil Descriptions
Appling	AmC2	Med erodibility, med to rapid surface runoff	Appling sandy loam, well drained, on ridges and side slope, 6 to 10 percent slopes. Moderate available water capacity and permeability.
Appling	AnC2	Med erodibility, med to rapid surface runoff	Appling sandy clay loam, well drained, on ridges and side slopes, 6 to 10 percent slopes. The soil has a moderate available water capacity and permeability.
Appling-Hard Labor	ApB	Med erodibility, med to rapid surface runoff	Appling-Hard Labor complex, 2 to 6 percent slopes. Appling is a well drained soil on ridges and side slopes with moderate available water capacity and permeability. Hard Labor is a moderately well drained soil on summits and sideslopes of uplands. The soil has a seasonal high water table at a depth of 2.5 to 5 feet, moderate available water capacity, and slow permeability.
Appling	ApC	Med erodibility, med to rapid surface runoff	Appling sandy loam, well drained, on ridges and side slopes, 6 to 10 percent slopes. Moderate available water capacity and permeability.
Cecil	CeB	Med erodibility, med to rapid surface runoff	Cecil sandy loam, well drained, on uplands, 2 to 6 percent slopes. Moderate available water capacity and permeability.
Cecil	CeC	Med erodibility, med to rapid surface runoff	Cecil sandy loam, well drained, on uplands, 6 to 10 percent slopes. Moderate available water capacity and permeability.
Cecil	CfC2	Med erodibility, med to rapid surface runoff	Cecil clay loam, well drained, in the uplands, 6 to 10 percent slopes. Moderate permeability and available water capacity.
Cecil	CYB2	Med erodibility, med to rapid surface runoff	Cecil sandy loam, well drained, on uplands, 2 to 6 percent slopes. Moderate available water capacity and permeability.
Cecil	CYC2	Med erodibility, med to rapid surface runoff	Cecil sandy loam, well drained, on uplands, 6 to 10 percent slopes. Moderate permeability and available water capacity.
Chewacla	Cfs*	Low erodibility, low surface runoff	Chewacla soils, somewhat poorly drained, on flood plains, slope 0 to 2 percent, frequently flooded. The seasonal high water is 0.5 to 1.5 feet. High available water capacity with moderate permeability.

Table 4

Summary of Soil Series Occurring Within the Project Study Area

Soil Series	Soil Mapping Unit	Erodibility (Low, Med, High)	Soil Descriptions
Chewacla-Wehadkee	Cw*	Low erodibility, low surface runoff	Chewacla-Wehadkee complex. Wehadkee soil is poorly drained, commonly flooded, slopes are less than 2 percent, and on floodplains. The soil has seasonal high water at 0.5 to 1.5 feet. Moderate available water capacity and permeability. Chewacla soil is somewhat poorly drained, commonly flooded, on floodplains, slopes are 0 to 2 percent. The soil has seasonal high water at 0.5 to 1.5 feet. Moderate available water capacity and permeability.
Gwinnett	GeB2	Med erodibility, med to rapid surface runoff	Gwinnett clay loam, well drained, on ridges, 2 to 6 percent slopes. Moderate available water capacity and permeability.
Gwinnett	GeC2	Med erodibility, med to rapid surface runoff	Gwinnett clay loam, well drained, on ridges, 6 to 10 percent slopes. Moderate available water capacity and permeability.
Hard Labor	HdB	Med erodibility, med to rapid surface runoff	Hard Labor sandy loam, moderately well drained, on summits and side slopes of uplands, 2 to 6 percent slopes. The soil has a seasonal high water table at a depth of 2.5 to 5 feet. Moderate available water capacity and slow permeability.
Lloyd	LfB2	Med erodibility, med to rapid surface runoff	Lloyd clay loam, well drained, on uplands and high terraces, 2 to 6 percent slopes. Moderate available water capacity and permeability.
Lloyd	LfC2	Med erodibility, med to rapid surface runoff	Lloyd clay loam, well drained, on uplands and high terraces, 6 to 10 percent slopes. Moderate available water capacity and permeability.
Lloyd	LfD2	Med erodibility, med to rapid surface runoff	Lloyd clay loam, well drained, on uplands and high terraces, 10 to 15 percent slopes. Moderate available water capacity and permeability.
Louisburg	LuE	High erodibility, rapid surface runoff	Louisburg sandy loam, well drained, on ridges and side slopes, 10 to 25 percent slopes. Low available water capacity and rapid permeability.
Madison	MdC	High erodibility, rapid surface runoff	Madison sandy loam, well drained, on uplands, 6 to 10 percent slopes. Moderate available water capacity and permeability.
Madison	MIC2	High erodibility, rapid surface runoff	Madison sandy clay loam, well drained, on uplands, 6 to 10 percent slopes. Moderate available water capacity and permeability.

Table 4
Summary of Soil Series Occurring Within the Project Study Area

Soil Series	Soil Mapping Unit	Erodibility (Low, Med, High)	Soil Descriptions
Madison	MID2	High erodibility, rapid surface runoff	Madison sandy clay loam, well drained, on uplands, 10 to 15 percent slopes. Moderate available water capacity and permeability.
Musella	MCD	High erodibility, rapid surface runoff	Musella cobbly loam, well drained, on ridges and side slopes, 6 to 15 percent slopes. Low available water capacity and moderate permeability.
Pacolet	PfB2	High erodibility, rapid surface runoff	Pacolet sandy loam, well drained, on uplands, 2 to 5 percent slopes. Moderate available water capacity and permeability.
Pacolet	PfC2	High erodibility, rapid surface runoff	Pacolet sandy loam, well drained, on uplands, 6 to 10 percent slopes. Moderate available water capacity and permeability.
Pacolet	PgC2	High erodibility, rapid surface runoff	Pacolet sandy clay loam, well drained, on uplands, 6 to 10 percent slopes. Moderate available water capacity and permeability.
Pacolet	PuD2	High erodibility, rapid surface runoff	Pacolet soils, well drained, on uplands, 10 to 15 percent slopes. Moderate available water capacity and permeability.
Toccoa	ToA	Low erodibility, low surface runoff	Toccoa fine sandy loam, 0 to 4 percent slopes, well drained to moderately well drained, on flood plains and natural levees, frequently flooded for very brief periods from October to May. It has a seasonal high water table from November to April at a depth of 30 to 60 inches. Moderate availability of water capacity and permeability.
Wilkes-Iredell	WHD	Med erodibility, med to rapid surface runoff	Wilkes-Iredell cobbly complex, 6 to 15 percent slopes. Wilkes is a well drained soil on ridges and side slopes with low available water capacity and moderately slow permeability. Iredell is a moderately well drained to somewhat poorly well drained soil on the uplands. The soil has a seasonal high water table at a depth of 1 to 2 feet. Available water capacity is high and the permeability is slow.
Worsham	WkB*	High erodibility, rapid surface runoff	Worsham sandy loam, poorly drained, 2 to 6 percent slopes, on low stream terraces, heads of drainageways, in depressions, and base of slopes. The soil has a seasonal high water table at a depth of 0 to 1 feet. Available water capacity is moderate and the permeability is slow to very slow.
Wedowee	WrE2	High erodibility, rapid surface runoff	Wedowee sandy loam, well drained, on uplands, 10 to 25 percent slopes. Moderate available water capacity and permeability.

* Listed as hydric by the USDA-SCS

Field soil samples were taken to a minimum depth of 12-inches. The soils were studied for examples of hydromorphic features (i.e., oxidized rhizospheres, redox concentrations, redox depletions, low chroma, concretions, and water saturation). *Munsell Soil Color Charts* (Kollmorgen Instruments Corporation, 1991) were used to determine hue, value, and chroma of both the matrix and the mottle colors of each horizon. Hue indicates the relationship to the primary colors in the spectrum of white light; value indicates the lightness of the color; and chroma represents the strength. A low chroma soil with bright mottles or gleyed soil indicates a hydric soil, if the low chroma is a result of a reducing environment rather than natural color or parent materials. A low chroma soil generally has a matrix chroma of 2 or less in mottled soils or a matrix chroma of 1 or less in unmottled soils.

Hydrology

Wetland hydrology is the driving force for the creation of hydric soils and the development of hydrophytic vegetative communities; and is assessed by observing field indicators. Research suggests that the most influential factor for plant community development is the duration of soil saturation or inundation, rather than the frequency of the event. In addition, the presence of wetland hydrology is essential during the growing season. The growing season is defined as the period in which soil temperatures are above 5°C (41.5°F) or as the period between the last frost of spring and the first frost of winter.

A classification system of wetland hydrology for non-tidal areas, developed by the Department of the Army Waterways Experiment Station, is presented in Table 4 (*Federal Manual, 1987).*

Table 5
Hydrologic Zones* - Non-Tidal Areas

Zone	Name	Duration**	Comments
I†	Permanently inundated	100%	Inundation > 6.6 feet mean water depth
II	Semipermanently to nearly permanently inundated or saturated	> 75% - < 100%	Inundation defined as ≤ 6.6 feet mean water depth
III	Regularly inundated or saturated	> 25% - 75%	
IV	Seasonally inundated or saturated	> 12.5% - 25%	
V	Irregularly inundated or saturated	≤ 5% - 12.5%	Many areas having these hydrologic characteristics are not wetlands
VI	Intermittently or never inundated or saturated	< 5%	Areas with these hydrologic characteristics are not wetlands

* Zones adapted from Clark and Benforado (1981).
** Refers to duration of inundation and/or soil saturation during the growing season.
† This defines an aquatic habitat zone.

Analysis of the hydrology parameter for a Routine Determination involves reviewing a study area for indicators of extended periods of wetland hydrology. Some indicators of wetland hydrology are identified in the 1987 *Federal Manual.* These indicators include recorded data, visual observation of inundation, visual observation of soil saturation, watermarks, drift lines,

sediment deposits, drainage patterns within the wetlands, oxidized rhizospheres by live roots within the soil profile, and water-stained leaves. In addition, the presence of wetland hydrology may be inferred from certain morphological, physiological, and reproductive adaptations of plants to an anaerobic environment. Only the morphological adaptations can be determined in the field. Examples of morphological adaptations include buttressed tree trunks, pneumatophores, adventitious roots, shallow root systems, inflated vegetative structures, polymorphic leaves, floating leaves and stems, hypertrophied lenticels, and multi-trunks or stooling. The facultative-neutral option also can be used as a secondary indicator of wetland hydrology.

Study Results

Field studies identified the presence of two jurisdictional wetlands, eleven jurisdictional streams, four jurisdictional ephemeral channels, and two non-jurisdictional wet weather conveyances within the proposed project study area. The jurisdictional wetlands were classified as palustrine emergent systems. The jurisdictional wetlands were delineated using fluorescent pink flagging marked — WETLAND BOUNDARY. The jurisdictional waters were classified as riverine lower perennial or intermittent systems. Intermittent and lower perennial streams were flagged with blue and white striped flagging. Wet weather conveyances (WWC) and ephemeral channels were identified and flagged with orange polka-dot flagging. Following is a brief description and table of the characteristics for each type of jurisdictional system encountered. Jurisdictional areas were located with a global positioning system (GPS). This information has been incorporated into existing GTC Geographic Information System (GIS) files. Please refer to Table 6 for a summary of the jurisdictional wetlands identified. Please refer to Table 7 for a summary of the jurisdictional waters identified. The locations of jurisdictional areas are shown on Figures 6A through 6G.

Jurisdictional Wetland Characteristics

Palustrine Emergent Wetland Systems

Emergent wetlands are characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens (Cowardin, 1989). Emergent wetlands typically occur in agricultural fields, right of ways, and may be found in isolated depressions, on gentle seepage slopes, or along narrow streams. One wetland data point was taken within each jurisdictional wetland to determine individual characteristics. Please refer to Figure 4B for a representative photograph of this wetland type. Specific wetland data sheets can be provided upon request

Typical Wetland Characteristics

Dominant vegetation within palustrine emergent systems delineated along the proposed line includes the following species.

Scientific Name	Common Name	Indicator Status
Ludwigia decurrens	seedbox	OBL
Scirpus cyperinus	woolgrass	OBL
Carex intumescens	bladder sedge	FAC-OBL
Typha latifolia	broad-leaf cattail	OBL
Arundinaria gigantea	giant cane	FACW+
Juncus effusus	soft rush	FAC-OBL
Polygonum sagittatum	tear thumb	OBL
Peltandra virginica	arrow arum	OBL
Eleocharis obtusa	spikerush	OBL

Typically, indicators of wetland hydrology included inundation, saturated soils within the upper 12 inches, oxidized root channels, water-stained leaves, and drainage patterns in wetlands. Soil samples were taken from a depth of 0 to 12 inches. In most cases, soils at a depth of 0 to 12 inches had a matrix color of 10YR 4/1 or 10YR 4/2; however, some wetland systems had soils with a matrix color of 10YR 3/2 or 10YR 3/1. Mottling and iron concentrations typically had a color of 10YR 4/6 or 10YR 4/4. In most cases, the redoximorphic features appear faint. Typically, hydric soil indicators included reducing conditions and low chroma.

Upland Characteristics

Typical Upland Surroundings

Data for the upland areas surrounding jurisdictional wetland systems were also collected. Typical species found in the upland areas include the following species. Specific upland data sheets will be provided upon request.

Scientific Name	Common Name	Indicator Status
Pinus taeda	loblolly pine	FAC
Smilax rotundifolia	common greenbrier	FAC
Cornus florida	flowering dogwood	FACU+
Carya glabra	sweet pignut hickory	FACU
Quercus alba	white oak	FACU
Ilex opaca	American holly	FAC-
Quercus falcata	Southern red oak	FACU-
Liquidambar styraciflua	sweetgum	FAC
Liriodendron tulipifera	tulip tree	FAC
Fagus grandifolia	American beech	FACU-
Rubus argutus	serrate-leaf blackberry	FACU
Polystichum acrostichoides	Christmas fern	FAC
Festuca arundinacea	Kentucky fescue	FAC-
Andropogon virginicus	broomsedge	FAC-
Eupatorium capillifolium	dog fennel	FACU

Upland habitats have insufficient indicators of wetland hydrology or hydric soils. Soil samples taken from a depth of 0 to 12 inches had a matrix color of 10YR 4/6. There are some areas in which the upland soils matrix color was 10YR 6/6 or 10YR 4/4. For each of the surrounding upland areas, the data point was determined to be outside of the wetland area, because all three wetland parameters were not met.

Table 6
Summary of Jurisdictional Wetlands

Jurisdictional Wetland	USGS Association	Cowardin Classification	Flow Regime / Community Type	Area Surveyed (ac)	Figure Location
J Wet 1	Unnamed Tributary to Little Mulberry River	PEM1B	palustrine emergent	0.02	6A
J Wet 2	Unnamed Tributary to Little Mulberry River	PEM1B	palustrine emergent	0.05	6A

Jurisdictional Water Characteristics

The proposed Jim Moore Road – Sharon Church 230 kV Transmission Line and the future Flanagan Mill Road Substation site study area includes 11 jurisdictional waters. These waters were either classified as riverine lower perennial streams, riverine intermittent streams, palustrine open water systems, or ephemeral channels. Typically, the size of stream, flow characteristics, position in the watershed, and substrate determines the classification. Please refer to Table 7 for a summary of jurisdictional waters identified within the project study area. Please refer to Figures 6A through 6G for locations of these features.

Lower Perennial Streams

For those streams that were classified as riverine lower perennial, typically the substrate was cobble-gravel, sand, mud, or bedrock. The size of lower perennial streams varied between three and 60 feet in width at the top of channel (TOC). Examples of large perennial streams located along the project corridor are Little Mulberry River and Rock Creek. Perennial streams must have flow and substrate characteristics that indicate year-round flowing conditions on a consistent basis. Please refer to Figure 7 for a representative photograph of this jurisdictional feature.

Intermittent Streams

For those streams that were classified as riverine intermittent, typically the substrate is sand, mud, and organic material. In most cases, intermittent streams identified within the project area were less than six feet in width at the TOC. Intermittent stream flow is periodically driven by groundwater and will typically have an obvious groundwater initiation point, known as a groundwater discharge area. Often these areas are small pools or wetland areas at the head of the stream. Intermittent streams will flow more consistently during the winter months, because the

water table is closer to the ground surface due to reduced evapotranspiration. Please refer to Figure 7 for a representative photograph of this jurisdictional feature.

Ephemeral Channels

Ephemeral channels are drainages that convey water during and immediately following rainfall and lack evidence of year round flow or periodic groundwater connection. These features typically show a defined channel, substrate development, and must possess a significant nexus of connectivity to jurisdictional areas.

Table 7
Summary of Jurisdictional Waters

Jurisdictional Water	USGS Stream Association	Cowardin Classification	Flow Regime / Community Type	Width TOC* (ft)	Length Surveyed (ft)	Area Surveyed (ac)	Figure Location
J Wat 1	Rock Creek	R2UB123	lower perennial	6-20	2,545	NA	6B
J Wat 2	Unnamed tributary to Rock Creek	R2UB123	lower perennial	3-6	173	NA	6B
J Wat 3	Unnamed tributary to Rock Creek	R2UB123	lower perennial	3-5	352	NA	6B
J Wat 4	Unnamed tributary to Rock Creek	R2UB123	lower perennial	10-15	159	NA	6C
J Wat 5	Unnamed tributary to Rock Creek	R4SB57	intermittent	5-8	175	NA	6D
J Wat 6	Unnamed tributary to Little Mulberry River	R4SB45	intermittent	4-6	101	NA	6A
J Wat 7	Unnamed tributary to Little Mulberry River	R4SB457	intermittent	3-6	160	NA	6A
J Wat 8	Unnamed tributary to Little Mulberry River	R2UB123	lower perennial	15-20	525	NA	6F
J Wat 9	Little Mulberry River	R2UB23	lower perennial	45-60	1,347	NA	6F

Table 7
Summary of Jurisdictional Waters

Jurisdictional Water	USGS Stream Association	Cowardin Classification	Flow Regime / Community Type	Width TOC* (ft)	Length Surveyed (ft)	Area Surveyed (ac)	Figure Location
J Wat 10	Unnamed tributary to Mulberry River	R2UB123	lower perennial	10-15	114	NA	6G
J Wat 11	Unnamed tributary to Mulberry River	R4SB345	intermittent	4-5	36	NA	6G
EPH 1	Unnamed tributary to Rock Creek	NA	ephemeral tributary	1-2	141	NA	6B
EPH 2	Unnamed tributary to Rock Creek	NA	ephemeral tributary	1-4	94	NA	6B
EPH 3	Unnamed tributary to Rock Creek	NA	ephemeral tributary	2-12	145	NA	6B
EPH 4	Unnamed tributary to Rock Creek	NA	ephemeral tributary	1-3	173	NA	6C

*TOC = Top of Channel

Wet Weather Conveyances

Wet weather conveyances are eroded channels that typically convey storm water following rain events. Please refer to Figures 6A through 6G for locations of these features. The channels vary in width and depth. Most conveyances are between one and eight feet in width at TOC with substrates of clay, sand, stone, or leaf litter. There is no evidence of groundwater contribution to these channels; therefore, they exhibit flow only during and immediately following rain events. Each conveyance was classified as a surface scour, incised channel, or swale.

Jordan Jones & Goulding

SECTION 4
Permit Considerations

SECTION 4
Permit Considerations

Section 404 Overview

Section 404 of the Clean Water Act provides the Secretary of the Army, acting through the Chief of Engineers, the power to issue Individual Permits and to authorize the use of Nationwide Permits (NWP) for the discharge of dredged or fill materials (i.e. impacts) into the waters of the United States, including special aquatic sites and wetlands (Nation's Waters). District engineers have the authority to issue permits for activities in the Nation's Waters.

For many of the NWPs, a Pre-Construction Notification (PCN) must be submitted to alert the local district office of the USACE of the intent to use a NWP. The PCN must describe the wetland system, provide specifications of the proposed project, identify the prospective permittee, include a mitigation plan, if required, and include a delineation of affected wetlands. The USACE will request a review of the PCN by other resource agencies. Other resource agencies include USFWS, National Marine Fisheries Service, U.S. Environmental Protection Agency, State Historic Preservation Office, and, in the State of Georgia, the Department of Natural Resources.

Anticipated USACE Permit Requirements

The USACE permits minor impacts to jurisdictional areas for utility line activities such as overhead utility lines, substations, access roads, and foundations for towers, poles and anchors under NWP 12 (utility line activities). NWP 12 allows a maximum impact of 0.5 acre of permanent fill within wetlands and/or 1,500 linear feet of stream. A PCN is required in the following cases.

- Any impacts to jurisdictional areas (Georgia Regional Conditions 2007).
- Mechanized land clearing in a forested wetland for a utility line ROW.
- A project requiring Section 10 permitting.
- The utility line in waters of the U.S., excluding overhead lines, exceeds 500 linear feet.
- The utility line is placed within a jurisdictional area, and it runs parallel to a stream bed that is within that jurisdictional area.
- Discharges associated with the construction of substations resulting in a loss of greater than 0.10 acres of waters of the U.S.
- Permanent access roads constructed above grade in waters of the U.S. for more than 500 linear feet.
- Impervious permanent access roads constructed in waters of the U.S.

A PCN for NWP 12 consists of avoidance and minimization analysis, a compensatory mitigation plan, and an assessment of any potentially significant historic or archaeological sites on or near the property.

NWP 12 requires that the following standards be followed for activities pertaining to utility lines. The construction, expansion, or maintenance of a substation in non-tidal waters of the United States, excluding non-tidal wetlands adjacent to tidal waters, is allowed provided that a loss of no more than 0.5 acre occurs. Foundations for towers, poles and anchors must be the minimum size necessary and provide separate footings for each tower leg. Access roads in non-tidal waters, excluding non-tidal wetlands adjacent to tidal waters, must not cause the loss of more than 0.1 acre of non-tidal waters and/or wetlands or 100 linear feet of stream per individual crossing. The cumulative loss of waters of the U.S. for all NWP 12 crossings in a Hydrologic Cataloging Unit cannot exceed 10 acres of wetlands and/or 1,500 linear feet of stream.

Anticipated Project Impacts

As reported in Section 3: Jurisdictional Studies of this report, two jurisdictional wetlands, eleven jurisdictional streams, and four ephemeral channels are located within the study area. A PCN will be required if streams and wetlands will be impacted as a result of the construction of necessary access roads that will be used for construction and maintenance of the proposed transmission line and substation. Existing access roads will be utilized where possible. However, some streams and wetlands will likely need to be crossed and some new access points may need to be established. The majority of impacts to wetlands and waters will likely be in the form of short culverts and at-grade road crossings. Final permitting recommendations are dependent on the access and construction plans.

State and Local Regulations of Jurisdictional Waters

Georgia EPD

The proposed project will not require a Georgia Environmental Protection Division Stream Buffer Variance, because all land disturbing activities within the 25-foot designated stream buffer will be necessary for access road enhancements and because encroachments will be constructed perpendicular to the water. All vegetation within 25-foot buffers will be hand-cleared. Much of the material will be lopped and left as fallen; any material to be removed will be removed without skidding or dragging. Impacts associated with installation or replacement of culverts at stream crossings are exempt from stream buffer and land disturbance permitting requirements.

Gwinnett County

Gwinnett County requires a 50-foot buffer from the top of each bank of intermittent and lower perennial streams. If a structure must be located within this buffer, then coordination with the Department of Planning and Development for Gwinnett County will be required.

Barrow County

Barrow County requires a 100-foot stream buffer on the Mulberry River from the top of each bank. A 150-foot buffer is required on the Mulberry River within 7 miles of a water supply intake or reservoir. For primary and secondary trout streams, a 50-foot corridor is required. A 25-foot buffer from the top of each bank of regulated streams is required for all other streams not in water supply watersheds. If a structure must be located within this buffer, then coordination with the local issuing authority for Barrow County will be required.

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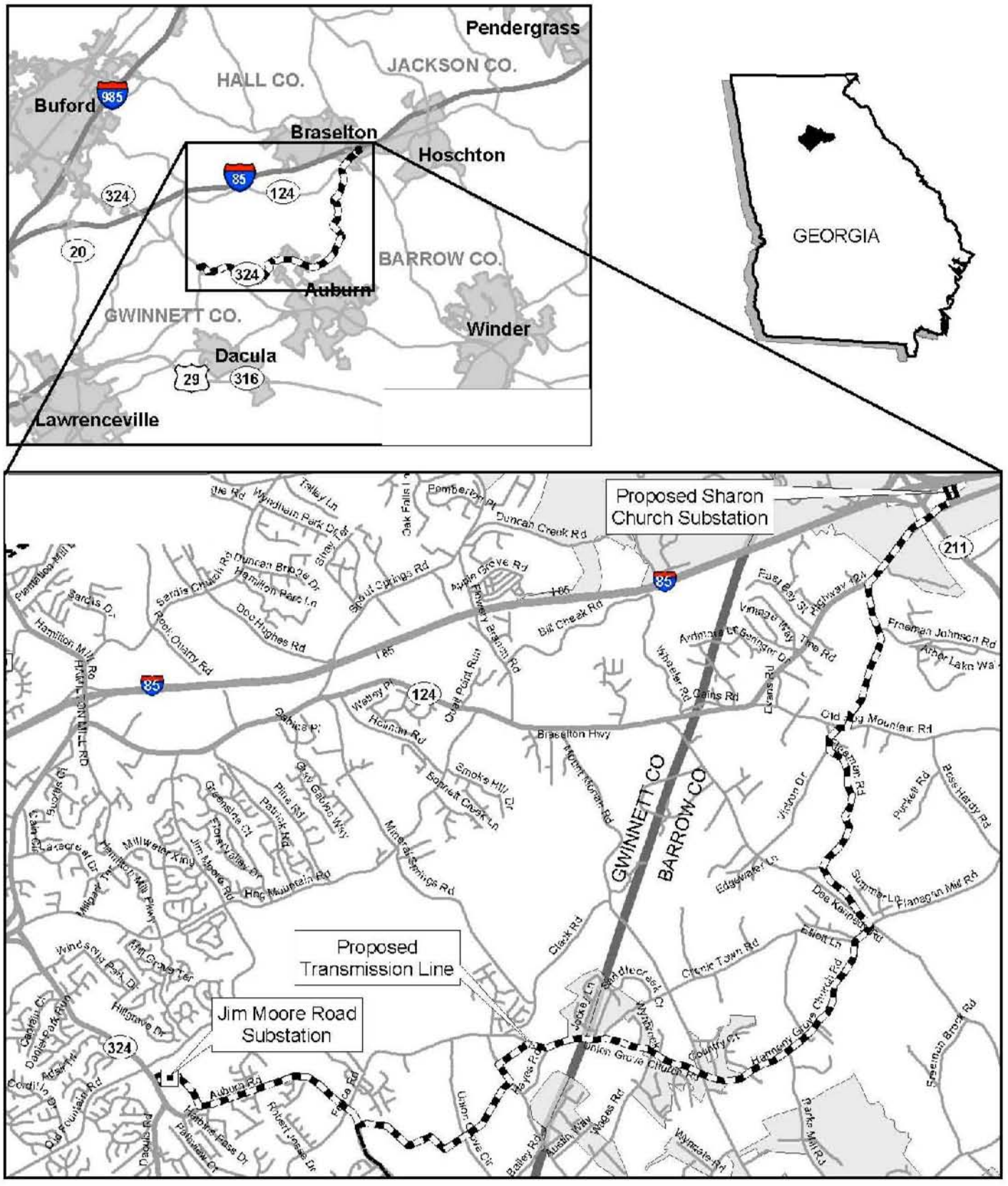
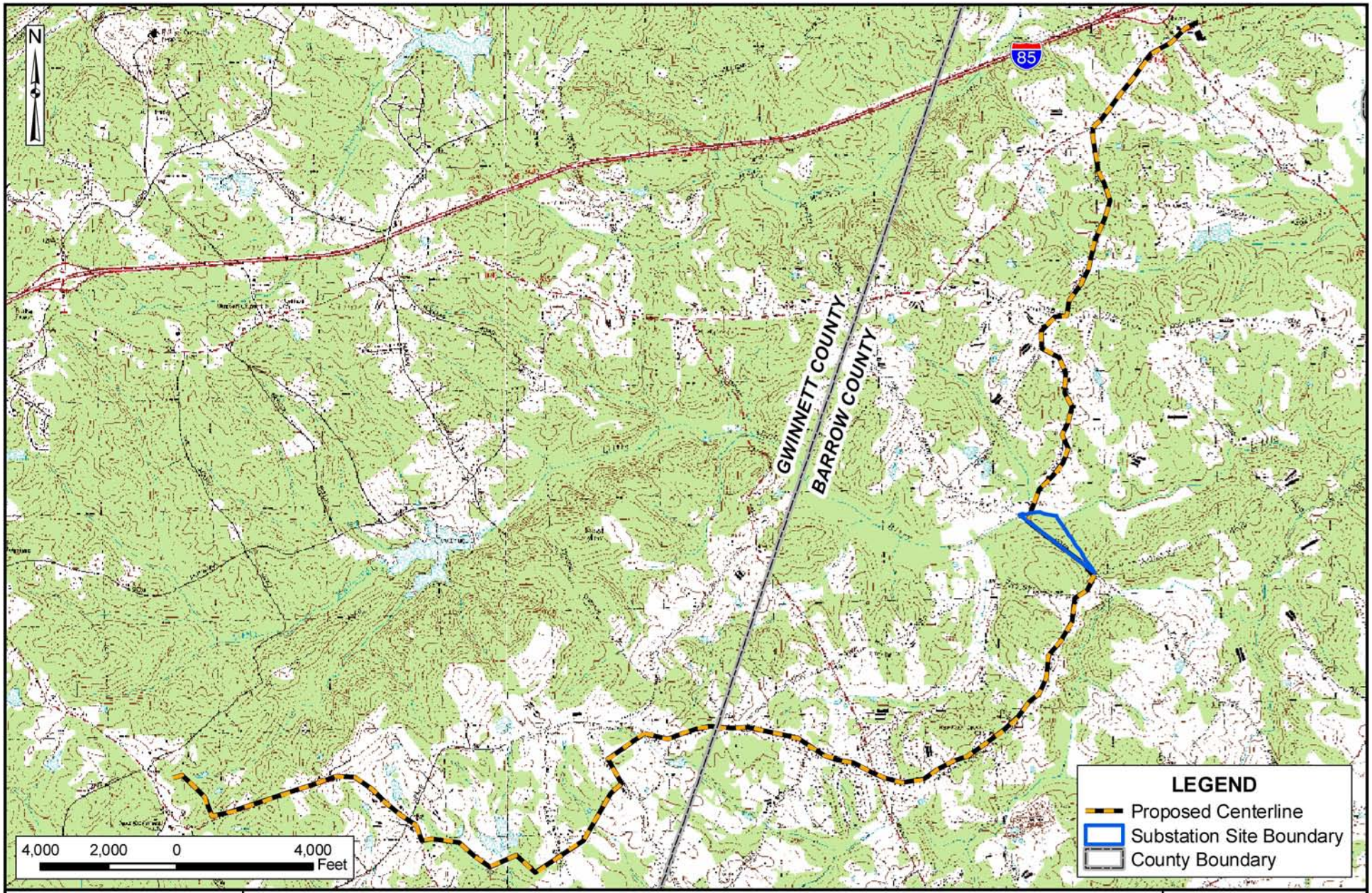
FIGURES



GeorgiaTransmission JORDAN JONES & GOULDING	Jim Moore Road-Sharon Church 230 kV Transmission Line and Flanagan Mill Road Advanced Land Purchase Substation Site Gwinnett and Barrow Counties, Georgia	Date: January 2008 Scale: Not To Scale Proj. No.: 04123204
	Project Location Map	Figure 1



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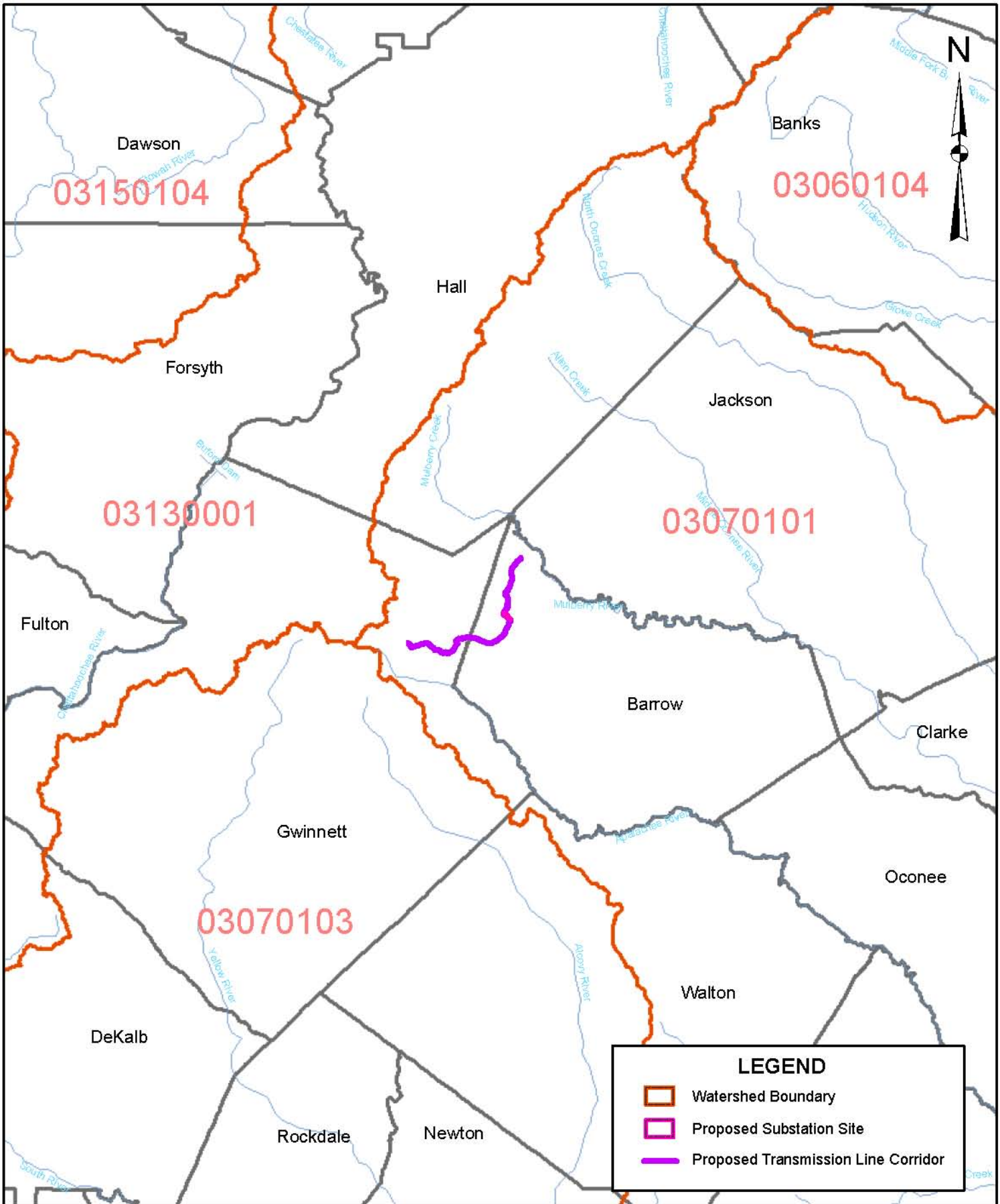
Jim Moore Road-Sharon Church 230 kV Transmission Line and
Flanagan Mill Road Advanced Land Purchase Substation Site
Gwinnett and Barrow Counties, Georgia

Hog Mountain, GA and Auburn, GA USGS 7.5 Minute Topographic Maps

Date: January 2008
Scale: 1" = 4000'
Proj. No.: 04123204

Figure 2



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Jim Moore Road-Sharon Church 230 kV Transmission Line
and Flanagan Mill Road Advanced Land Purchase Substation Site
Gwinnett and Barrow Counties, Georgia

Hydrologic Unit Map

Date: January 2008
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Figure 3

Ruderal Community

Agricultural Community

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Jim Moore Road-Sharon Church 230 kV Transmission Line and Flanagan Mill Road Advanced Land Purchase Substation Site Gwinnett and Barrow Counties, Georgia

Representative Photographs of Vegetation Communities

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Figure 4A

Secondary-Successional Mixed Hardwoods-Pine Community

Emergent Wetland Community

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Jim Moore Road-Sharon Church 230 kV Transmission Line and Flanagan Mill Road Advanced Land Purchase Substation Site Gwinnett and Barrow Counties, Georgia

Representative Photographs of Vegetation Communities

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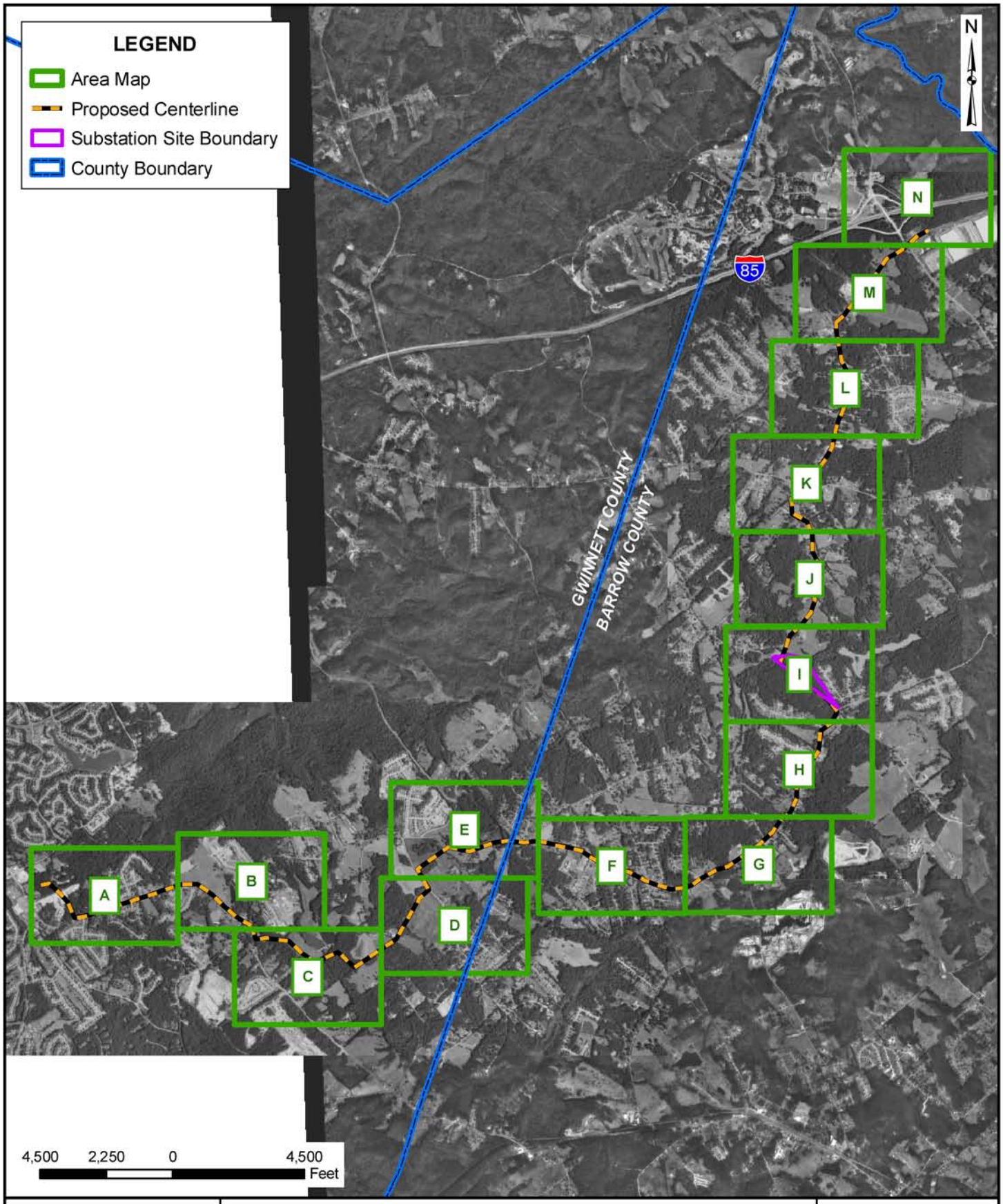
Scale:	Not Applicable
Project No.:	04123204

Figure 4B



GeorgiaTransmission

JORDAN JONES & GOULDING

Jim Moore Road-Sharon Church 230 kV Transmission Line and Flanagan Mill Road Advanced Land Purchase Substation Site
Gwinnett and Barrow Counties, Georgia

Soils Map - Index

Date: January 2008
Scale: 1" = 4500'
Proj. No.: 04123204

Figure 5